

**The standards applicable to a "genus/species" rejection under MPEP 2144.05**

The rejection either qualifies as, or closely resembles a genus/species type obviousness rejection. Basically, the examiner believes that the genus of brines described in the prior art includes multivalent brines, and the examiner has used the description of that genus in the prior art to reject Applicants' claims to both a new method for using a multivalent brine and to the precursor polymer dispersion formed using that brine.

Under MPEP 2144.05, to establish a prima facie case of obviousness in a genus-species chemical composition situation, as in any other 35 U.S.C. 103 case, it is essential that Office personnel find some motivation or suggestion to make the claimed invention in light of the prior art teachings. See, e.g., *In re Brouwer*, 77 F.3d 422, 425, 37 USPQ2d 1663, 1666 (Fed. Cir. 1996) ("[T]he mere possibility that one of the esters or the active methylene group-containing compounds . . . could be modified or replaced such that its use would lead to the specific sulfoalkylated resin recited in claim 8 does not make the process recited in claim 8 obvious 'unless the prior art suggested the desirability of [such a] modification' or replacement.") (quoting *In re Gordon*, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984); *In re Vaack*, 947 F.2d 488, 493, 20 USPQ2d 1438, 1442 (Fed. Cir. 1991) ("[A] proper analysis under Section 103 requires, inter alia, consideration of . . . whether the prior art would have suggested to those of ordinary skill in the art that they should make the claimed composition or device, or carry out the claimed process."). In order to find such motivation or suggestion there should be a reasonable likelihood that the claimed invention would have the properties disclosed by the prior art teachings. The prior art disclosure may be express, implicit, or inherent. Regardless of the type of disclosure, the prior art must provide some motivation to one of ordinary skill in the art to make the claimed

invention in order to support a conclusion of obviousness. See, e.g., Vaack, 947 F.2d at 493, 20 USPQ2d at 1442 (A proper obviousness analysis requires consideration of "whether the prior art would also have revealed that in so making or carrying out [the claimed invention], those of ordinary skill would have a reasonable expectation of success."); In re Dow Chemical Co., 837 F.2d 469, 473, 5 USPQ2d 1529, 1531 (Fed. Cir. 1988) ("The consistent criterion for determination of obviousness is whether the prior art would have suggested to one of ordinary skill in the art that this process should be carried out and would have a reasonable likelihood of success, viewed in the light of the prior art."); Hodosh v. Block Drug Co., 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir.), cert. denied, 479 U.S. 827 (1986). MPEP 2144.05.

When evidence of secondary considerations such as unexpected results is initially before the Office, for example in the specification, that evidence should be considered in deciding whether there is a *prima facie* case of obviousness. The determination as to whether a *prima facie* case exists should be made on the full record before the Office at the time of the determination.

**The examiner's reasoning mandates a finding of non-obviousness**

The examiner's arguments to date are, i.e., that all of the brines taught in the references would be expected to act the same, and that a person of ordinary skill in the art would be equally motivated use any of the brines--monovalent or multivalent--to form the precursor polymer dispersion.

The examiner's reasoning weighs in favor of a finding of non-obviousness. **The testing evidence submitted by Applicants established that--for the purposes of forming the claimed precursor polymer dispersion--all brines are not equal.** Billy Chesser testified in his

Declaration that

to be considered

When fresh water or aqueous solutions of monovalent salts, such as sodium chloride, were used to prehydrate the claimed water-soluble polymers, and those polymers were added to a final brine and the final brine subjected to heat equivalent to temperatures that might be experienced downhole, those final brines tended to agglomerate and form a highly viscous mass with unsuitable rheology and filtration control properties.

Chesser Decl., ¶ 6. Mr. Chesser's testimony establishes that it is **critical** to the claimed invention that the precursor brine comprise a salt comprising cations "consisting essentially of cations of one or more **multivalent** alkaline earth metals."

Based on the examiner's own reasoning, the cited art would **not** motivate a person of ordinary skill in the art to select a multivalent brine over a monovalent brine to form the claimed precursor polymer dispersion. The examiner has not pointed to any teaching or suggestion in any reference that it is **critical** to use a brine comprising cations "consisting essentially of cations of one or more **multivalent** alkaline earth metals" to form a precursor polymer dispersion that can be added to a high density brine even absent additional solvating agents, and still result in a brine with adequate rheology and filtration control properties under downhole conditions. The examiner therefore has not established a case of *prima facie* obviousness. MPEP 2144; 2144.05.

The examiner admits that DD teaches an initial brine solution of NaCl--a monovalent salt. If one follows the teachings of DD, one would use a monovalent salt to form a precursor brine and a multivalent salt to form the final brine. One would not be motivated to use a multivalent salt to form an initial or "precursor brine" to prehydrate water soluble polymers.

The mere fact that calcium chloride and calcium bromide brines are well known, or are taught in House, does not supply the missing teaching to use those brines to form the claimed precursor polymer dispersion. The examiner has the burden to point to a teaching or suggestion in the references that would motivate a person of ordinary skill in the art to form a "**precursor**

**polymer dispersion**”: comprising a salt “consisting essentially of cations of one or more multivalent alkaline earth metals”; having a sufficient density; and, containing a sufficient concentration of water soluble polymer to achieve the claimed results even without the use of additional solvating agents. The examiner has failed to point to such a teaching or suggestion in the cited references.

Mondshine's failure to describe anything inconsistent with making the required substitution of a multivalent salt for Mondshine's monovalent salt, and Mondshine's asserted failure to state that the other salts “contain some type of character flaw and that they cannot perform the intended purpose” is not an express teaching or suggestion of the **criticality** of using multivalent salts to form the precursor polymer dispersion, as required by the claims.

The examiner attempts to fill the gap left by DD and Mondshine by pointing to a teaching in House to form “calcium bromide/zinc bromide with particles for dispersions with subsequent addition of calcium carbonate, resulting in a final brine.” The examiner points to column 14 of House as teaching against teaching the addition of polymers to brines containing multivalent salts, and subsequently adding  $\text{CaCO}_3$  to the solution. The examiner contends that “[t]he hydration does not occur until [the] after the  $\text{CaCO}_3$  is added.” Office action, p. 3. In response to Applicant's argument that House's  $\text{CaCO}_3$  is a particulate solid filler, the examiner merely contends that “it will produce another salt, which would be expected to have the same effect.”

If the examiner is equating House's brine solutions with Applicant's precursor polymer dispersion, then the examiner has not pointed to any teaching or suggestion in House to add a sufficient amount of polymer to House's multivalent cation brines to achieve the claimed dispersion. Although the broadest claims do not quantitatively limit the amount of polymer in the precursor polymer dispersion, the claims do require the overall amount of polymer in the dispersion to be

sufficient that--upon addition to a final brine even in the absence of additional solvating agents--effective rheology and/or filtration control is achieved. Narrower claims specify that this amount is from about 0.5 lb to about 4 lb/gallon of polymer, preferably 1-2 lb/gallon. The examiner has not pointed to any teaching in House that would motivate a person of ordinary skill in the art to use such a large a quantity of polymer in House's brine. See House Examples (Ex. 1, 3 ppb or 0.07 lb/gal polymer; Ex. 2, 2 ppb or 0.05 lb/gal polymer; Exs. 4-10, e ppb or 0.07 lb/gal; Ex. 11, 4 ppb + 7.1 ppb or 11.1 ppb, 0.26 lb/gal.) This fact merely illustrates that the brine described in House correlates to the "final brine" in the claims--not to the precursor brine used to form the precursor polymer dispersion.

In addition, as applicant previously explained, the " $\text{CaCO}_3$ " referred to by the examiner is not an aqueous solution of salt, as required by the claims. The  $\text{CaCO}_3$  is described as a

solid, particulate inert filler. . . [which] aids in dispersibility and increases the rate of hydration of the polymer compositions in heavy brine solutions. Accordingly, the desired rheology is obtained at a faster rate when the polymer solutions are added to such brines. The filler should be a material which exhibits little or no absorption capacity for the solvating agent and is, in general, non-reactive with the hydrophilic polymer, solvating agent or the diluting agent.

Non-limiting examples of such solid, particulate, inert fillers include kaolin, alumina, silica, diatomaceous (sic) earth, oil soluble resins, alkaline earth metal carbonates, alkali metal carbonates, etc.

Col. 5, ll. 19-31. As further explained in Hawley's Condensed Chemical Dictionary (11<sup>th</sup> Ed. 1987) p. 202 (emphasis added), calcium carbonate is a "[w]hite powder or colorless crystals; odorless, tasteless, d 2.7-2.95, decomposes at 825C, noncombustible, **very slightly soluble in water (a few ppm).**"

The examiner appears to contend that the addition of solid, particulate  $\text{CaCO}_3$ , and some "very slight" dissolution of the  $\text{CaCO}_3$  in House's brine containing water soluble polymers inherently "would be expected to have the same effect" (office action, p. 5) as that produced

by the addition of a diluting agent. The examiner's argument is based on the fact that the diluting agent, silica, is a solid, particulate, inert filler.

when the claimed precursor polymer dispersion is added to a high density brine. The basis for such a conclusion is far from clear. In any event, the MPEP makes it clear that "[t]he fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic." [citations omitted] **MPEP 2112.** "In relying upon a the theory of inherency, **the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.**" **MPEP 2112.**

The examiner has failed to meet this burden.

First of all, House uses additional solvating agents to achieve adequate rheology and filtration control. The composition that actually corresponds to Applicant's precursor polymer dispersion in House is House's "thickener" solution. In House's "thickener" solution, water soluble polymer is dispersed in a "solvating agent" and, if desired, a diluting agent and a compatibilizing agent. House's solvating agent is nothing at all like Applicants' claimed a "precursor brine," but rather a "water miscible, polar organic liquid which exhibits a swelling effect on the polymer." Col. 2, ll. 62-65:

Non-limiting but preferred solvating agents include: aliphatic glycols containing from 2 to 5 carbon atoms such as ethylene glycol, 1,2-propanediol, 1,4-butanediol, 1,3-pentanediol and the like; alkylene triols containing from 2 to 6 carbon atoms such as glycerol, 1,2,3-butane-triol, 1,2,3-pentanetriol, and the like; lower molecular weight polyalkylene glycols containing 4 to 9 atoms, such as diethylene glycol, triethylene glycol, and the like; amides containing from 1 to 4 carbon atoms such as formamide, acetamide, dimethyl formamide, and the like; and the mixtures of the various above compounds.

Col. 3, ll. 14-25. The diluting agent is described as "any liquid organic compound or material which is not a solvating agent." Col. 3, ll. 30-32. Given examples of compatibilizing agents include organophilic clays and finely divided siliceous materials. Col. 3, l. 30 - col. 4, l. 27.

The examiner's has not pointed to teachings in the cited references which would motivate a person of ordinary skill in the art to make the claimed precursor polymer dispersion by mixing (1) a **relatively large quantity of water soluble polymer**--specified in some claims to be about 0.5-4 lb per gallon (claims 2, 14, 29, 43), preferably about 1-2 lb per gallon (claims 3, 15, 30, 44, 59), (2) with a **precursor brine comprising a salt comprising cations "consisting essentially of one or more multivalent alkaline earth metals."** MPEP 2143.01; *In re Brouwer*, 37 U.S.P.Q.2d 1663, 1666 (Fed. Cir. 1995).

The examiner criticizes applicants argument that the claims solve the problem of how to hydrate a water soluble polymer, stating that "[t]he instant claims are directed to a method of making a polymer precursor dispersion." Apparently the examiner is referring to the preamble of claim 1. The preamble of claim 1 has been amended to clarify that claim 1 is directed to a method of hydrating a water soluble polymer.

A review of the specification makes the focus of the invention clear:

The viscosity of a drilling or completion brine typically is maintained using polymers, such as starches, derivatized starches, gums, derivatized gums, and celluloses. **Although these polymers are water-soluble, they have a relatively low hydration rate in brines because very little water actually is available to hydrate the polymers, particularly in high density brines.**

**Heating a brine to at least about 140°F will increase the hydration rate of starches and/or other water-soluble polymers in the brine. However, heating of brine is time consuming, expensive, and difficult to achieve in the field. Plus, heating of a brine will cause starch dispersed in the brine to build excessive viscosity when subjected to high wellbore temperatures.**

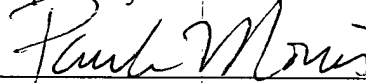
Less time consuming and expensive methods that will effectively hydrate water-soluble polymers in high density brines without adversely affecting downhole viscosity are sorely needed.

Specification, p. 2, l. 11-p. 3, l. 1. The present invention provides such a method.

## CONCLUSION

For all of the foregoing reasons, Applicants respectfully request entry of the amendments and reconsideration and allowance of all of the pending claims.

Respectfully submitted,



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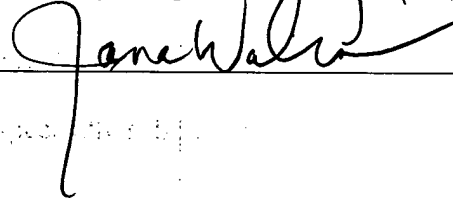
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